



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,644	04/06/2006	Tsuyoshi Suda	075954-010100	6544
33717 7590 06/09/2009 GREENBERG TRAURIG LLP (L.A.) 2450 COLORADO AVENUE, SUITE 400E INTELLECTUAL PROPERTY DEPARTMENT SANTA MONICA, CA 90404				
EXAMINER KASTEN, ROBERT J				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
06/09/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/534,644

Applicant(s)

SUDA ET AL.

Examiner

ROBERT KASTEN

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5/11/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-37 is/are rejected.
- 7) ☒ Claim(s) 5 and 23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-893)
Paper No(s)/Mail Date See Continuation Sheet
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :6/19/2007, 03/07/2007, 01/10/2007, 09/19/2005.

DETAILED ACTION

1. This is a first non-final action on the merits.
2. Claims 1-37 were pending. Claims 1-37 are rejected.

Specification

3. The disclosure is objected to because of the following informalities: the use of "atomicity" when to "atomic" hydrogen [0006], or "As the solid electrolyte can be exemplified phosphorous tungstic acid or phosphorous molybdc acid which has good adhesion for the first electrode and the second electrode and is excellent as an electrolyte for the hydrogen gas sensor [0029], etc.

Appropriate correction is required.

Claim Objections

4. Claims 5 and 23 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Both claims recite intended use language only and therefore does not add further structural limitations to the independent claim.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 4191

6. Claims 10, 14-16, 28 and 32-34 and is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Regarding claim 10 and 28, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Regarding Claims 14-16 and 32-34, applicant uses the phrase "Shumitt Inverter." Examiner assumes this to be a misspelling, and has examined this phrase to read as a "Schmitt Inverter" or Schmitt trigger. Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-6, 9, 21-24 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by TANIGUCHI et al (US 2002/0070109 A1), from here on in referred to as TANIGUCHI.

Concerning Claim 1, TANIGUCHI teaches a hydrocarbon sensor with a substrate and a solid electrolyte with two electrodes described in [0035] and [0037] and best exemplified by Figure 1B. The first electrode (12a) is made from

Art Unit: 4191

"a paste containing Au particles and Al particles" which is baked, "forming the electrode containing Au and Al [0018]." The other electrode (12b) can be "made of Pt [0040]." These two electrodes, with their correspondingly different compositions, inherently differ in chemical potential for hydrogen gas. The limitation of hydrogen gas being detected on a generated electromotive force is intended use language and has not been given patentable weight.

Concerning Claim 2, TANIGUCHI teaches a hydrocarbon sensor with a substrate and a solid electrolyte with two electrodes [0035] and [0037], the first electrode being made from "a paste containing Au particles and Al particles" which is baked, "forming the electrode containing Au and Al [0018]." The other electrode can be "made of Pt [0040]." These two electrodes, with their correspondingly different compositions, inherently differ in absorption-dissociation active degree for hydrogen gas. The limitation of hydrogen gas being detected on a generated electromotive force is intended use language and has not been given patentable weight.

Concerning Claims 3-4, TANIGUCHI teaches a hydrocarbon sensor with a substrate and a solid electrolyte with two electrodes [0035] and [0037], the first electrode being made from "a paste containing Au particles and Al particles" which is baked, "forming the electrode containing Au and Al [0018]." The other electrode can be "made of Pt [0040]." These two electrodes, with their correspondingly different compositions which inherently exhibit the standard electromotive forces required in claim 3.

Concerning Claim 5, all limitations are intended use language and therefore not structurally limiting.

Concerning Claim 6, TANIGUCHI teaches all the limitations for claim 1. Further, TAIGUCHI discloses Figure 1B, which shows two electrodes (12a and 12b) which are placed in a planar sandwich configuration around the electrolyte (11). This planar configuration reads on the claimed "plate," and the sandwich configuration reads on the placement of the electrolyte between the electrodes.

Concerning Claims 9 and 27, TANIGUCHI teaches a solid electrolyte [0035].

Concerning Claims 21-22, TANIGUCHI teaches all the limitations of claim 2. Further, TANIGUCHI teaches a hydrocarbon sensor with a substrate and a solid electrolyte with two electrodes[0035] and [0037], the first electrode being made from "a paste containing Au particles and Al particles" which is baked, "forming the electrode containing Au and Al [0018]." The other electrode can be "made of Pt [0040]." These two electrodes, with their correspondingly different compositions which inherently exhibit the standard electromotive forces required in claim 21.

Concerning Claim 23, all limitations are intended use language and therefore not structurally limiting.

Concerning Claim 24, TANIGUCHI teaches all the limitations for claim 2. Further, TAIGUCHI discloses Figure 1B, which shows two electrodes (12 a and 12b) which are placed in a planar sandwich configuration around the electrolyte

Art Unit: 4191

(11). This planar configuration reads on the claimed "plate," and the sandwich configuration reads on the placement of the electrolyte between the electrodes.

10. Claim 20 is rejected under 35 U.S.C. 102(b) as being anticipated by SCHOEB (US 2002/0000228), from here on referred to as SCHOEB.

Concerning Claim 20, SCHOEB teaches in Figure 8 as gas forwarding apparatus which contains a gas sensor portion 8 for determining a gas composition. As described in [0038], gas sensor 8 comprises a photo sensor portion 8b and a light source 8c. Light source 8c can be an LED. By applicant's own definition, the Fail-Safe function can be the detection of an LED by a photo sensor.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Art Unit: 4191

13. Claims 7, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over TANIGUCHI as applied to Claims 1-6, 9, 21-24 and 27 above, and further in view of MAKUNDAN et. al. (US 6,656,336), from here on in referred to as MAKUNDAN.

Concerning Claim 7, TANIGUCHI discloses a gas sensor with two electrodes with different chemical potentials for hydrogen gas.

TANIGUCHI does not appear to expressly disclose that the electrodes may be arranged as rods on a substrate with an electrolyte disposed in between.

However, MAKUNDAN discloses Figure 1B, a hydrocarbon sensor in which two electrodes 12 and 16 are disposed on an electrolyte 10. Electrode 16 is obvious in the shape of a rod.

At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to modify the electrodes of TANIGUCHI to be rods as those of MAKUNDAN because the positioning of the electrodes yields no significant functional difference and are therefore are a matter of obvious engineering choice. Although only one electrode in MAKUNDAN is actually shaped like a rod, one of ordinary skill in the art would not have difficulty discerning that electrode 12 could be fashioned in the same way.

Concerning Claim 25, TANIGUCHI discloses a gas sensor with two electrodes with different chemical potentials for hydrogen gas.

TANIGUCHI does not appear to expressly disclose that the electrodes may be arranged as rods on a substrate with an electrolyte disposed in between.

Art Unit: 4191

However, MAKUNDAN discloses Figure 1B, a hydrocarbon sensor in which two electrodes 12 and 16 are disposed on an electrolyte 10. Electrode 16 is in the shape of a rod.

At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to modify the electrodes of TANIGUCHI to be rods as those of MAKUNDAN because the positioning of the electrodes yields no significant functional difference and are therefore are a matter of obvious engineering choice. Although only one electrode in MAKUNDAN is actually shaped like a rod, one of ordinary skill in the art would not have difficulty discerning that electrode 12 could be fashioned in the same way.

14. Claims 8 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over TANIGUCHI as applied to Claims 1-6, 9, 21-24 and 27 above, and further in view of SUGIYAMA et. al. (US 4,704,536), from here on in referred to as SUGIYAMA.

Concerning Claim 8, TANIGUCHI discloses a gas sensor with two electrodes with different chemical potentials for hydrogen gas with an electrolyte disposed in between.

TANIGUCHI does not appear to expressly disclose that the electrodes may be arranged as concentric cylinders.

However, SUGIYAMA discloses Figure 9, a gas sensor with two co-axial electrodes 23 and 24 configured as concentric cylinders.

At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to modify the gas sensor configuration of TANIGUCHI

Art Unit: 4191

with the concentric, cylindrical electrodes in SUGIYAMA because the positioning of the electrodes yields no significant functional difference, and therefore concentric cylindrical electrodes are a matter of an obvious engineering choice.

Concerning Claim 26, TANIGUCHI discloses a gas sensor with two electrodes with different chemical potentials for hydrogen gas.

TANIGUCHI does not appear to expressly disclose that the electrodes may be arranged as rods on a substrate with an electrolyte disposed in between.

However, Sugiyama discloses Figure 9, a gas sensor with two co-axial electrodes 23 and 24 configured as concentric cylinders.

At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to modify the gas sensor configuration of TANIGUCHI with the concentric, cylindrical electrodes in SUGIYAMA because the positioning of the electrodes yields no significant functional difference, and therefore concentric cylindrical electrodes are a matter of an obvious engineering choice.

15. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over TANIGUCHI in view of YUN et. al. (WO 01/89021), from here on in referred to as YUN.

Concerning Claim 10, TANIGUCHI discloses all the limitations of claim 9.

TANIGUCHI does not appear to expressly disclose the electrolyte comprise an internal scaffold of a material such as glass wool.

However, YUN discloses in the abstract an electrolyte in which contains an electrospun matrix of polymeric, electrolytic material into which lithium salt-

Art Unit: 4191

dissolved organic electrolytes are incorporated. One of the advantages of this construction as outlined by YUN is a "good mechanical strength."

At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to modify the electrolyte of TANIGUCHI with an internal matrix like YUN because one would wish to take advantage of the improved mechanical strength such a construction would offer.

16. Claims 11-16, 29-34 and 29 rejected under 35 U.S.C. 103(a) as being unpatentable over TANIGUCHI as applied to Claims 1-6, 9, 21-24 and 27 above, and further in view of CHRISTEN et al, from here on in referred to as CHRISTEN.

Concerning Claims 11-13, TANIGUCHI teaches a hydrocarbon sensor with all the limitations of claim 1. The preambles for each claim (e.g. "a hydrogen gas leak controlling system" or "a hydrogen gas leak information transmitting system," etc.) are not structurally limiting and have not been given patentable weight.

TANIGUCHI does not expressly teach that a voltage comparator be used in the apparatus.

However, CHRISTEN teaches a gas sensing signaling system. In particular, CHRISTEN teaches a figure 7 which includes three comparators 101/1, 101/2, 101/3. These are voltage comparators (col. 12, lines 21-33).

At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to include a voltage comparator like that from CHRISTEN in the apparatus of TANIGUCHI because of the necessary

Art Unit: 4191

advantages of doing so, such as eliminating false alarms or alarms for negligible concentrations of gas.

Concerning Claims 14-16, TANIGUCHI in view of CHRISTEN teaches a hydrocarbon sensor with all the limitations of claims 11-13. The preambles for each claim (e.g. "a hydrogen gas leak controlling system" or "a hydrogen gas leak information transmitting system," etc.) are not structurally limiting and have not been given patentable weight. Further, the only further limiting structural features of these claims are the presence of a Schmitt trigger (Schmitt inverter), as functional language modifying the trigger has not been given patentable weight.

TANIGUCHI does not expressly teach that a voltage comparator be used in the apparatus, nor does TANIGUCHI teach the use of a Schmitt trigger.

However, CHRISTEN teaches a gas sensing signaling system. In particular, CHRISTEN teaches a figure 7 which includes three comparators 101/1, 101/2, 101/3. These are voltage comparators (col. 12, lines 21-33). Further, CHRISTEN teaches the use of Schmitt triggers to distinguish between warning signals and alarm signals (col. 15, lines 32-43).

At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to include a voltage comparator and Schmitt trigger like that from CHRISTEN in the apparatus of TANIGUCHI because of the necessary advantages of doing so, such as eliminating false alarms or alarms for negligible concentrations of gas.

Concerning Claims 29-31, TANIGUCHI teaches a hydrocarbon sensor with all the limitations of claim 2. The preambles for each claim (e.g. "a hydrogen gas leak controlling system" or "a hydrogen gas leak information transmitting system," etc.) are not structurally limiting and have not been given patentable weight.

TANIGUCHI does not expressly teach that a voltage comparator be used in the apparatus.

However, CHRISTEN teaches a gas sensing signaling system. In particular, CHRISTEN teaches a figure 7 which includes three comparators 101/1, 101/2, 101/3. These are voltage comparators (col. 12, lines 21-33).

At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to include a voltage comparator like that from CHRISTEN in the apparatus of TANIGUCHI because of the necessary advantages of doing so, such as eliminating false alarms or alarms for negligible concentrations of gas.

Concerning Claims 32-34, TANIGUCHI in view of CHRISTEN teaches a hydrocarbon sensor with all the limitations of claims 29-31. The preambles for each claim (e.g. "a hydrogen gas leak controlling system" or "a hydrogen gas leak information transmitting system," etc.) are not structurally limiting and have not been given patentable weight. Further, the only further limiting structural features of these claims are the presence of a Schmitt trigger (Schmitt inverter), as functional language modifying the trigger has not been given patentable weight.

TANIGUCHI does not expressly teach that a voltage comparator be used in the apparatus, nor does TANIGUCHI teach the use of a Schmitt trigger.

However, CHRISTEN teaches a gas sensing signaling system. In particular, CHRISTEN teaches a figure 7 which includes three comparators 101/1, 101/2, 101/3. These are voltage comparators (col. 12, lines 21-33). Further, CHRISTEN teaches the use of Schmitt triggers to distinguish between warning signals and alarm signals (col. 15, lines 32-43).

At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to include a voltage comparator and Schmitt trigger like that from CHRISTEN in the apparatus of TANIGUCHI because of the necessary advantages of doing so, such as eliminating false alarms or alarms for negligible concentrations of gas.

17. Claims 17-18 and 35-36 are rejected under 35 U.S.C 103(a) as being unpatentable over TANIGUCHI as applied to claims 1-6, 9, 21-24 and 27 above in view of MAKI et. al. (US 2004/0026268), from here on referred to as MAKI.

Concerning Claim 17, TANIGUCHI teaches all the limitations of claim 1.

TANIGUCHI does not expressly teach that there be a plurality of hydrogen gas sensors arranged on the same substrate.

However, MAKI teaches an apparatus which is an electromotive force type gas sensor comprising a substrate and a gas sensor on that substrate (MAKI, claim 1). Further, MAKI teaches a claim 8 drawn to an electromotive force gas sensor with two or more electromotive force gas sensors on the same substrate.

At the time of the invention, it would have been *prima facie* obvious to those of ordinary skill in the art to provide a plurality of gas sensors like in TANIGUCHI on the same substrate like in MAKI because of the versatility such a configuration would have, such as the ability to allow for failure of some gas sensors without failure of the whole apparatus as well as the ability to possibly discern a target gas profile or concentration gradient.

Concerning Claim 18, TANIGUCHI teaches all the limitations of claim 1. Further, "for detecting an electromotive force from said hydrogen gas sensor" and "is detected in dependence on the intensity of said electromotive force" are statements of intended use and not given patentable weight.

TANIGUCHI does not expressly teach an electric circuit be provided.

However, MAKI teaches an apparatus which is an electromotive force type gas sensor comprising a substrate and a gas sensor on that substrate (MAKI, claim 1). Further, MAKI teaches a power supply circuit be present on the substrate, which reads on the electric circuit (page 9, [0110]).

At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to use the power supply circuit of MAKI in the device of TANIGUCHI because one would wish to process the signals output from the electrodes.

Concerning Claim 35, TANIGUCHI teaches all the limitations of claim 2.

TANIGUCHI does not expressly teach that there be a plurality of hydrogen gas sensors arranged on the same substrate.

However, MAKI teaches an apparatus which is an electromotive force type gas sensor comprising a substrate and a gas sensor on that substrate (MAKI, claim 1). Further, MAKI teaches a claim 8 drawn to an electromotive force gas sensor with two or more electromotive force gas sensors on the same substrate.

At the time of the invention, it would have been *prima facie* obvious to those of ordinary skill in the art to provide a plurality of gas sensors like in TANIGUCHI on the same substrate like in MAKI because of the versatility such a configuration would have, such as the ability to allow for failure of some gas sensors without failure of the whole apparatus as well as the ability to possibly discern a target gas profile or concentration gradient.

Concerning Claim 36, TANIGUCHI teaches all the limitations of claim 2. Further, "for detecting an electromotive force from said hydrogen gas sensor" and "is detected in dependence on the intensity of said electromotive force" are statements of intended use and not given patentable weight.

TANIGUCHI does not expressly teach an electric circuit be provided.

However, MAKI teaches an apparatus which is an electromotive force type gas sensor comprising a substrate and a gas sensor on that substrate (MAKI, claim 1). Further, MAKI teaches a power supply circuit be present on the substrate, which reads on the electric circuit (page 9, [0110]).

At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to use the power supply circuit of MAKI in the device of TANIGUCHI because one would wish to process the signals output from the electrodes.

Art Unit: 4191

18. Claims 19 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over TANIGUCHI as applied to Claims 1-6, 9, 21-24 and 27 above in view of SCHOEB.

Concerning Claim 19, TANIGUCHI teaches all the limitations of claim 1.

TANIGUCHI does not expressly teach that the gas sensor comprise a photo sensor or an LED.

However, SCHOEB teaches in Figure 8 as gas forwarding apparatus which contains a gas sensor portion 8 for determining a gas composition. As described in [0038], gas sensor 8 comprises a photo sensor portion 8b and a light source 8c. Light source 8c can be an LED. By applicant's own definition, the Fail-Safe function can be the detection of an LED by a photo sensor.

At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to use the LED/photo sensor arrangement of SCHOEB in the device of TANIGUCHI because the LED/photo sensor has been shown to be an acceptable means to convert a measured gas signal into an observable output.

Concerning Claim 37, TANIGUCHI teaches all the limitations of claim 2.

TANIGUCHI does not expressly teach that the gas sensor comprise a photo sensor or an LED.

However, SCHOEB teaches in Figure 8 as gas forwarding apparatus which contains a gas sensor portion 8 for determining a gas composition. As described in [0038], gas sensor 8 comprises a photo sensor portion 8b and a

Art Unit: 4191

light source 8c. Light source 8c can be an LED. By applicant's own definition, the Fail-Safe function can be the detection of an LED by a photo sensor.

At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to use the LED/photo sensor arrangement of SCHOEB in the device of TANIGUCHI because the LED/photo sensor has been shown to be an acceptable means to convert a measured gas signal into an observable output.

19. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over TANIGUCHI as applied to Claims 1-6, 9, 21-24 and 27 above in view of YUN.

Concerning Claim 28, TANIGUCHI discloses all the limitations of claim 2.

TANIGUCHI does not appear to expressly disclose the electrolyte comprising an internal scaffold of a material such as glass wool.

However, YUN discloses in the abstract an electrolyte in which contains an electrospun matrix of polymeric, electrolytic material into which lithium salt-dissolved organic electrolytes are incorporated. One of the advantages of this construction as outlined by YUN is a "good mechanical strength."

At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to modify the electrolyte of TANIGUCHI with an internal matrix like YUN because one would wish to take advantage of the improved mechanical strength such a construction would offer.

Conclusion

Art Unit: 4191

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT KASTEN whose telephone number is (571)270-7598. The examiner can normally be reached on Mon-Thurs, 8am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Barbara Gilliam can be reached on 571-272-1330. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. K./
Examiner, Art Unit 1795

/Brian J. Sines/
Supervisory Patent Examiner, Art Unit 1795